



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-1063; Project Identifier AD-2021-01339-T; Amendment 39-22375; AD 2023-05-06]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain The Boeing Company Model 737-8, 737-9, and 737-8200 airplanes. This AD was prompted by a determination that new airworthiness limitations are necessary to require periodic replacement; or testing, and replacement if necessary; of the oxygen sensor of the nitrogen generation system (NGS). This AD requires revising the existing maintenance or inspection program, as applicable, to incorporate the new airworthiness limitations. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES:

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2022-1063; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any

comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

Material Incorporated by Reference:

- For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available at regulations.gov under Docket No. FAA-2022-1063.

FOR FURTHER INFORMATION CONTACT: Sam Dorsey, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3415; email: samuel.j.dorsey@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain The Boeing Company Model 737-8, 737-9, and 737-8200 airplanes. The NPRM published in the *Federal Register* on November 28, 2022 (87 FR 72902). The NPRM was prompted by a determination that a new airworthiness limitation is necessary to require periodic replacement of the oxygen sensor of the NGS. In the NPRM, the FAA proposed to require revising the existing maintenance or inspection program, as applicable, to incorporate the new airworthiness limitation. The FAA is issuing this AD to prevent increasing the flammability exposure

of the center fuel tank, which together with an ignition source in the fuel tank, could lead to a fuel tank explosion and consequent loss of the airplane.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from the Air Line Pilots Association, International (ALPA) and an individual who supported the NPRM without change.

The FAA received additional comments from four commenters, including Boeing, American Airlines, SIA Engineering Company, and United Airlines (United). The following presents the comments received on the NPRM and the FAA's response to each comment.

Request to Refer to Latest Service Information

Boeing and United requested that the proposed AD be revised to specify compliance with Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022, instead of Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated January 2019. Boeing noted that Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022 includes a revision to 47-AWL-09 and the addition of new airworthiness limitation 47-AWL-10 (which is a Critical Design Configuration Control Limitation (CDCCL) that specifies procedures for oxygen sensor repairs). Boeing added that the revision to 47-AWL-09 provides additional options for operators beyond replacing the oxygen sensor with a new oxygen sensor. Those options include testing the installed NGS oxygen sensor using a functional check described in the Airplane Maintenance Manual (AMM) (and replacing if necessary), and replacing the oxygen sensor with an NGS oxygen sensor repaired as specified in 47-AWL-10. United noted that these changes provide operators with benefits necessary for the efficient accomplishment of task 47-AWL-09.

The FAA partially agrees with the commenters' requests. Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022, provides options that are relieving, but also includes a new CDCCL requirement that was not included in the proposed AD. The FAA has therefore revised this AD to require incorporating the information specified in AWL No. 47-AWL-09, "Nitrogen Generation System – Oxygen Sensor," of Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated January 2019; or the information specified in 47-AWL-09 and 47-AWL-10 of Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022.

Request to Refer to Latest Service Information

American Airlines requested that the FAA add a provision to accomplish the oxygen sensor replacement with a repaired or overhauled sensor instead of a brand new sensor. The commenter noted that this provision would ease the burden on operators by not requiring them to scrap used sensors and buy new ones. American Airlines added that the 737NG fleet has a similar AWL requirement, with a provision that a repaired sensor may be installed.

The FAA agrees with the commenter's request. As noted previously, this AD has been revised to allow incorporating the information in Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022, which includes provisions for replacing the oxygen sensor with a repaired oxygen sensor or testing the oxygen sensor, and replacing if necessary.

Request to Clarify Applicability

SIA Engineering Company asked that the FAA confirm the commenter's understanding of paragraph (c) of the proposed AD. SIA Engineering Company requested confirmation that the proposed AD does not affect The Boeing Company Model 737-8, 737-9, and 737-8200 airplanes having original airworthiness certificate or original export

certificate of airworthiness issued on or before April 1, 2021, and with a line number not identified in paragraph (c)(2) of the proposed AD.

The FAA agrees to clarify. This AD applies to The Boeing Company Model 737-8, 737-9, and 737-8200 airplanes having original airworthiness certificate or original export certificate of airworthiness issued on or before April 1, 2021, and it also applies to The Boeing Company Model 737-8, 737-9, and 737-8200 airplanes with a line number specified in paragraph (c)(2) of this AD. This AD does not apply to any airplanes not specified in paragraph (c)(1) or (2) of this AD.

Request to Revise a Sentence in the Background

Boeing requested that the FAA revise a sentence in the Background section. In the NPRM the sentence reads “Degraded performance by the sensor could result in the [air separation module] ASM failing to produce nitrogen-enriched air, and the fuel tank becoming more flammable due to excessive oxygen-enriched air.” Boeing stated that this sentence is inaccurate because it implies a causality between a failing oxygen sensor and a degrading ASM, when there is none. Boeing added that the sentence further implies that the oxygen enriched air (OEA) is redirected to the fuel tanks if the ASMs start going bad. Boeing stated that the sentence should state: “Degraded oxygen sensor performance could result in the system failing to detect when the ASM performance degrades below the acceptable threshold for nitrogen-enriched air, and the fuel tank becoming more flammable due to receiving poor-quality nitrogen-enriched air.”

The FAA agrees that there is no causality between the degraded performance of the oxygen sensor and failure of ASM. Degradation of the oxygen sensor performance does not directly result in the ASM failing to produce nitrogen-enriched air, but rather it would result in a failure to detect the condition of the ASM not performing at a required level. However, the sentence in question from the Background section of the NPRM will

not be carried over to this final rule. Therefore, the FAA has not changed this AD regarding this issue.

Request to Include Cost for Replacement Sensor

United requested that the NPRM be revised to include the cost of a replacement NGS oxygen sensor and its availability.

The FAA disagrees with the commenter's request. This AD does not require compliance with the maintenance actions specified in the AWL items. Instead, this AD requires operators to revise their existing maintenance or inspection program, as applicable, to incorporate the new airworthiness limitations. Compliance with any airworthiness limitation is required by 14 CFR 91.403(c). Therefore, compliance with the AWLs is not a requirement of this AD, and including the cost of a replacement part would be inappropriate. The FAA has not changed this AD regarding this issue.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information under 1 CFR Part 51

The FAA reviewed Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated January 2019. This service information describes, among other airworthiness limitations (AWLs), airworthiness limitation instruction (ALI) AWL No. 47-AWL-09, "Nitrogen Generation System – Oxygen Sensor," for replacing oxygen sensors.

The FAA also reviewed Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022. This service information describes, among other AWLs, ALI AWL No. 47-AWL-09, “Nitrogen Generation System (NGS) – Oxygen Sensor,” for replacement; or testing, and replacement if necessary; of the oxygen sensor of the nitrogen generation system (NGS), and AWL No. 47-AWL-10, “Nitrogen Generation System (NGS) – Oxygen Sensor Repair,” for repairing oxygen sensors.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

Costs of Compliance

The FAA estimates that this AD affects 62 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

The FAA has determined that revising the existing maintenance or inspection program takes an average of 90 work-hours per operator, although the agency recognizes that this number may vary from operator to operator. Since operators incorporate maintenance or inspection program changes for their affected fleet(s), the FAA has determined that a per-operator estimate is more accurate than a per-airplane estimate. Therefore, the FAA estimates the average total cost per operator to be \$7,650 (90 work-hours x \$85 per workhour).

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA’s authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency’s authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2023-05-06 The Boeing Company: Amendment 39-22375; Docket No. FAA-2022-1063; Project Identifier AD-2021-01339-T.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None

(c) Applicability

This AD applies to The Boeing Company Model 737-8, 737-9, and 737-8200 airplanes, certificated in any category, identified in paragraphs (c)(1) and (2) of this AD.

(1) Airplanes with an original airworthiness certificate or original export certificate of airworthiness issued on or before April 1, 2021.

(2) Airplanes with line numbers 7668, 7678, and 7915.

(d) Subject

Air Transport Association (ATA) of America Code 28, Fuel.

(e) Unsafe Condition

This AD was prompted by significant changes made to airworthiness limitations (AWLs) related to the nitrogen generation system (NGS). The FAA is issuing this AD to prevent increasing the flammability exposure of the center fuel tank, which together with an ignition source in the fuel tank, could lead to a fuel tank explosion and consequent loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Maintenance or Inspection Program Revision

Within 60 days after the effective date of this AD, revise the existing maintenance or inspection program, as applicable, to incorporate the information specified in AWL No. 47-AWL-09, “Nitrogen Generation System – Oxygen Sensor,” of Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated January 2019; or the information specified in AWL No. 47-AWL-09, “Nitrogen Generation System (NGS) – Oxygen Sensor,” and AWL No. 47-AWL-10, “Nitrogen Generation System (NGS) – Oxygen Sensor Repair,” of Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022. The initial compliance time for accomplishing task AWL No. 47-AWL-09 is: Within 18,000 flight hours after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, within 18,000 flight hours after the most recent replacement or test was performed as specified in AWL No. 47-AWL-09, or within 12 months after the effective date of this AD, whichever is latest.

(h) No Alternative Actions, Intervals, or Critical Design Configuration Control Limitations (CDCCLs)

After the existing maintenance or inspection program has been revised as required by paragraph (g) of this AD, no alternative actions (e.g., inspections), intervals, or CDCCLs may be used unless the actions, intervals, and CDCCLs are approved as an alternative method of compliance (AMOC) in accordance with the procedures specified in paragraph (i) of this AD.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the

manager of the certification office, send it to the attention of the person identified in paragraph (j) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(j) Additional Information

For more information about this AD, contact Sam Dorsey, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3415; email: samuel.j.dorsey@faa.gov.

(k) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated January 2019.

(ii) Boeing 737-7/8/8200/9/10 Special Compliance Items/Airworthiness Limitations, D626A011-9-04, dated May 2022.

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on March 5, 2023.

Christina Underwood, Acting Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

[FR Doc. 2023-07034 Filed: 4/4/2023 8:45 am; Publication Date: 4/5/2023]